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Comparative Study: Impact of Family, School, and Students Factors on Students Achievements in Reading in Developed (Estonia) and Developing (Azerbaijan) Countries

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Abstract

The work is based on Pisa 2009 International Assessment Study. Two counties were selected: a developed country, Estonia and a developing country, Azerbaijan. The following Datum was used for statistical analysis: students average scores in reading (162 schools, 4 600 students from Azerbaijan; 17 schools, 4 923 students from Estonia). The work is based on mixed type research. The main goal is to determine the effect of different independent variables related to school, student, and household, on students' achievements in reading in developed and developing countries. Three research questions were developed:

1) To what extent are student background variables associated with reading scores in each country?

2) To what extent are family-related variables associated with reading scores in each country?

3) To what extent are school-related variables associated with reading scores in each country (variables were analyzed separately: organizational; instructional; and teacher-related)?

As with other research studies this research may have some limitations regarding research model, data analyses, and interpretations. For data analyses **t**test and General Linear Model – Univariate statistics were applied.

General Findings:

Estonia: Most of the teachers apply modern teaching methods; students' attitude towards reading activities, teacher, and school are positive. Parental involvement has a positive effect on students' achievements in reading.

Azerbaijan: The majority of the teachers do not apply modern teaching methods; students' attitudes towards reading activities are not deemed positive; students have negative attitudes towards school and teachers.

The research showed that different factors work differently in developed and developing countries cases.

Keywords: reading, general education, education policy, family factors, school factors, student factors

1. Introduction

1.1 Introduce the Problem

A students' achievement in reading is one of the key contributing factors not only in determining his/her success in other subject areas but also in the formation of well-informed citizen (Cawalti, 1991). Trilling (2009) assumes that a person to fulfill their obligations and be successful in 21st century job market requires having a proper education. Distinguished educators Piaget (1959) and Vgotsky (1978) developed arguments that high quality learning processes should incorporate interaction and critical thinking. Dewy (1933) emphasized that humans mostly learn through experience; once a student is engaged in activities that require thinking, memorization, and later on action, that this type of exercise has a high probability to be registered as experience. Two countries (Azerbaijan as developing and Estonia as developed states) were selected for the study. Both of them used to be part of the former Soviet Union. Consequently, their education systems were designed in the same style, the way it has been thought out centrally for the entire country. As the head of general education department head Dr. Irene Käosaar mentions in the interview that the Estonian government, with immense help of European Union, has exerted a lot of effort to move from the Soviet style of education to a more modern one. That effort has paid off enormously; Estonian ninth graders (15 years old) outperformed not only former Soviet republics but also all

former Communist bloc (Eastern European) countries in the PISA 2009 international assessment (13th place out of 65 countries and economies). On the other hand, Azerbaijani ninth graders failed to compete with their peers representing 65 different countries and/or economies. For example, they were placed right at the bottom of the table in reading (64th place).Another widespread challenge this type of study addresses is that most of, if not all, international assessments are focused on a small selective group of counties performance (The Great Britain, Japan, South Korea, Hon-Kong, Singapore, Canada, The United States of America, Germany and other European Union countries). For this reason, the analyses of the results derived from the international assessments mostly reflect the tendencies of developing counties education systems and has little to do with tendencies of developed counties education systems. Since, the student test results of the developing counties are not analyzed, education policy and decision makers develop programs and set the policy directions based on the developed counties education models (Riddel, 1997).

1.2 Importance of the Problem

This is a comparative study of two different counties students' performance in reading - Estonia, developed and Azerbaijan, developing country. Special attention was given to reading activity as one of the main determinants of student's overall success in all subject areas. Countries were defined as developed or developing using data of the National Statistics Institute and OECD. The Soviet education system as other areas of governance was closed to any international assessment or observation for more than 70 years was. Not much has been done since 1991 (collapse of the USSR) in terms of assessing trends and peculiarities of educational systems of countries that had been part of it. This study attempts to contribute to the new knowledge regarding the former Soviet Union states education systems. The study analyzes Estonian and Azerbaijani ninth graders performance in the PISA 2009 international assessment with the focus in reading, and is designed to come up with set of recommendations for both countries policy and decision makers and educators at large. The study looks at set of independent variables (grouped in three main categories: student, family, and school) that could explain the results of Azerbaijani and Estonian ninth graders in the reading test. The study tries to select those variables that have more explanatory power /impact on students' achievements in reading. It is hoped that this t will help education policy and decision makers in Azerbaijan and Estonia, in parallel to findings of other counties, to take into consideration those findings/evidences while designing programs or/and policies. The study puts more emphasizes on the factors that have statistically significant effect on ninth grade students achievements in reading. In addition, a vast variety of literature has been reviewed regarding family, student, and school related variables that have different impact on students' achievement specifically in reading.

1.3 Rature Review

1.3.1 Importance of Reading

Any school curriculum is based on three main pillars: reading, writing, and oral communication. Proper application of those elements help students develops basic core subject competences. Along with this, literature and language arts present students a chance to learn more about not only their own but also that of other cultures ideas and values. Generally, writing, reading and oral communication represents 60% of school curriculum at the elementary and middle school levels and 17% of school curriculum at the high school level (Squire, 1999). Squire asserts, development of students' skills in this direction ensures students success not only in school but alsoafter graduation.In the scientific literature concerning reading activities three main factors (family, student, and school) (are singled out that have considerable impact on students learning: PISA 2009 international assessment showed that students who comprehended what they read enjoyed significantly higher reading scores in the tests than students who read just to pass the test (PISA at glance, 2010).Anderson and Herman (1988) state that teaching students with strategy that help them to realize what is the content they are reading raises probability to score higher in the tests. The rationale behind the argument is simple: a student reads more when he or she understands the theme of the context (Anderson, at all, 1988). A number of researchers argue that understanding the essence of the text leads to better understanding, which helps students to raise their test scores and as well as overall academic achievement. Assessments done by the National Literacy Trust (2011) showed that reading and writing results are closely intertwined. In particular, 49% of the students who receive good grades in reading perform better in writing as well, while 59% of students who get low grades in reading receive low grades in writing (35% of them at predicted level and the rest below the predicted level). The research also finds that there is a relationship between students' enjoyment of reading and students' enjoyment of writing. For instance, 65% of students who like or like very much reading feel the same way towards writing. Approximately 38% of students who read daily write daily as well.

1.3.2 Factors Influencing Learning

Two seminal reports, one in the United States of America by Coleman et al., in 1966, and another in Great Britain by Plowden1967, urged educators, policy and decision makers to revise their views on those factors that have significant effects on student achievement (Peaker, 1971), Marzano (1998, 2003) single outs three key factors that have maximum effect on student achievement: school quality; teacher quality and students readiness to learn. He argues that each of these key factors has a large impact on students overall learning by the following percentage distribution: students' readiness by 80 %, teachers by 13, 3%, and school related factors by 6, 7%. Marzano provides six different hypothetical scenarios:

(1) Seven students with the same level of academic performance at the elementary school graduated from the high school with a mediocre teacher guiding them;

(2) The same seven students with the same academic performance level were enrolled in the failing school with the guidance of a failing teacher, graduated from the school but with a lower academic performance level;

(3) Students academic performance who entered in the successful school but were instructed by the mediocre teacher, were dropped significantly;

(4) Those students who were enrolled in the failing school but under the guidance of a highly qualified teacher graduated with high scores;

5) When students were enrolled in high achieving school with the guidance of highly qualified teacher student overall academic performance was 2.95 times higher;

6) When the same students entered in a high achieving school but were guided by a poorly qualified teacher they did not perform as well as students at a high achieve school under the guidance of a highly qualified teacher.

1.3.3 School Related Variables

Trilling and Fadel (2009) assert that in order to raise a competent 21stCentury work force schools should come up with different model of learning. They offer a "perfect learning storm" model that combines knowledge, work, thinking tools, digital lifestyle, and learning research. For this reason, despite the growing efforts of training teachers worldwide in how to help students construct and apply knowledge through discovery, explanation, and project learning methods, the ubiquitous peculiarity of the 21stCentury, the continuing teaching practices are still based on conveying knowledge to students via direct instruction. Marzano (2003) argues that the effective school variable is a significant factor to consider while analyzing student achievement, but only when we are talking about an average teacher. However, school variable fails to overcome an incompetent teacher's impact on the student achievement, while a highly qualified teacher's impact on students' academic performance triumphs over the failing school. Researchers Liza Darling – Hammond (2000) and Ferguson (1991) argue that teacher related factors explain students' academic performance by 60%. The research study done by Heyneman and Loxley (1983) concluded that the poorer the country the higher the impact of teacher and school related factors have on student academic achievement. When school related factors are analyzed there are three very important factors that need to be discussed separately: teacher; teacher student ratio; and class size. Hanushek, Rivkin and Kain (2005) argue that if one analyzes an academic year achievement results, mediocre and high performing teachers can be easily detected. Specifically, during one academic year an average student who is instructed by the high quality teacher moved up in the distribution by four percentile. That is equal to 0.12 standard deviation of the students' academic achievement. Based on that finding one can argue that teacher quality is highly correlated to students' academic performance. Another significant finding of that study was that a good teacher can reduce a detrimental effect caused by the students bad performance at home in preparing homework assignments. The researchers point out that high quality teachers could be one of the cures to students education problem, but it is daunting job to hire qualified teachers. Reaching high standards in subject and pedagogical competences cannot be achieved only through intensive training. Another big problem related to recruiting high ability individuals to join the teaching profession is that salary schedules are not properly adjusted to high quality teachers. Some experts at the Education Board of Finland and Korean Education Development Institute (KEDI) think that one of the reasons that their (Finish and Korean) kids top the PISA 2009 international assessment distribution is that both countries have been successful in recruiting their best and brightest to the teacher's profession for years. Another topic that scientific literature puts considerable emphases on is teacher education and experience. Andrews, Blackmon and Mackey (1980) argue that there is a weak positive relationship between the teachers' education level and students' academic performance (Our research in the case of Azerbaijan came up with a supportive finding to this argument.)Goodson and Hargreaves (1996) described a perilous tendency that can harm teachers – professional plateau -that no doubt will be reflected in student learning outcomes. Researchers

state that at some point, every teacher reaches that state but not all are able to overcome it. They suggest that a teacher should take a part in different professional development programs to avoid the detrimental effect of professional plateau. Goe and Holdheide (2011) came up with some measures that may improve teachers' performance. Measures that are isolated from the classroom, such as standardized tests administered once per year, are less likely to influence teachers' performance and student learning in a timely manner, while measures that are aligned with a core part of the curriculum and instruction may provide useful information to the teacher about which skills and knowledge students have already mastered. They think that in addition to this, "ongoing assessments and examination of student work, especially in cooperation with colleagues, which may not be included as part of a teacher evaluation but may be useful for teachers in determining next steps for their students. When teachers know areas in which the students are experiencing difficulty, they can use that information to make the necessary instructional adjustments (e.g., re-teaching), allowing extra opportunities for practice, instruction in small groups, peer tutoring, computer-assisted instruction, individual tutoring, or other changes in the method or type of instruction. In addition, teachers find value in working together to examine and score student work (e.g., essays, portfolios, or projects). Discussions with other teachers about the differences between an outstanding piece of work and a good one can be valuable to teachers in thinking about how to target specific criteria in their own instruction" (Goe&Holdheide, 2011). Gitomer (2007) assumes that the following measures may contribute in raising teachers' quality: (1) increase of states and institutions academic requirements for becoming teachers, often establishing or raising minimum grade point average (GPA) requirements to be enrolled into and/or graduation from teacher preparation academic programs and for acquiring licensure. (2) Accreditation processes have also become more accurate and focused on student academic performance. Taking into consideration the ubiquitous economic problem all over the globe, the group of authors of The New Teacher Project (2010) asserts that due to the recent economic downfall, most school districts have to make considerable budget cuts to survive. Since the largest portion of the school budget is spent on teachers' salary, these cuts lead districts to make the wrenching decision to lay off teachers. Researchers fear that the basic principle is "last hired, first fired;" where newer teachers are laid off before more veteran teachers, regardless of how well they do their jobs. In addition, that means districts will be forced to fire some of their best teachers, many of whom are unlikely to return. A number of research studies have found that the rationale behind seniority-based layoff policies is that more experienced teachers are better teachers. What is more, various research studies have shown that teachers improve the most over the course of their first years in the classroom, and then level off in effectiveness. Therefore, an individual teacher will almost certainly be more effective in her fifth year than in her first or second year. As Mosteller (1995) argues, there is no issue in schooling that brings out as much attention of education researchers and society as class size. Hanushek and others (1998) looked at relationship between teacher-student ratio and students' academic performance. They overviewed all six international assessments conducted from 1960 to 1990. They analyzed test results of students representing up to 70 different countries. Data analyses showed positive relationship but not statistically significant effect between teacher-student ration and students' academic performance. An interesting finding came up from the study conducted by Stevenson and Stigler (1992) general education schools in the United States and Japan. Both countries have approximately the same teacher-student ratio. Nevertheless, each countries education system differ drastically in terms of school organization and teachers employment practice. For those reasons, Japanese schools have a higher teacher-student ratio. However, Japanese students rank considerably higher in the international assessments than their American peers (In PISA 2009 international assessment Japanese ninth graders took 8th place while Americans are at 17th place). An Interesting economic theory was developed by Leizer (1999) in relation to class size. He states that students who are educated in the small classes learn more than students do in the bigger classes. He came up with the following rationales to support his notion: there is less probability of classroom disruption in small classes. That gives teacher a chance to reach all goals set for the class and students are able to present their works full without any interruption. He assumes that classroom disruption takes time and teachers energy. In the small classes, students are under close attention from the teacher or assistants' side. Well-guided students behave better. That in turn contributes to better learning and leads to high academic achievement. Based on Lezier model, the size of the class depends on the number of at risk students. The class size is big if there is less number of students with behavioral delinquency. In contrast, class size is small if those students with non-behavioral issues prevail. Teacher –student ratio factor was seen from a different angle by Ouchi and his research team (2009). The research conducted in eight large school districts across the United States (Boston, Seattle, Houston, St. Paul, San Francisco, Chicago, Oakland, and New York City) came up with the revolutionary discovery that raises school performance. One of the main findings of the research was that when a teacher teaches less than 80 students over the course of the academic year, student academic performance is considerably higher. In contrast, when the number of students exceeds 80 (before the experiment in some

schools that number was 140-170 per teacher) academic performance dropped. Researchers assert that when the total student load (TSL) is low there is a high probability of developing personal relationships between teachers and students. They think that it is a contributing factor to higher student performance. When the student feels that, he or she is perceived as a unique person and the teacher pays substantial attention to him or her, student motivation rises. In addition, in the case of allow student to teacher load, teachers correct less number of papers and put comments that are more meaningful.

1.3.4 Student Related Factors

Gender is among the student related factors that are specifically distinguished to interpret the reason that could cause a difference in reading scores. However, it is rather hard to detect gender effect on reading comprehension by controlling numerous other variables that could have considerable influence on reading scores. Guthry (1991) argues that girls are better readers because they like this activity more than boys do. In addition, girls are more motivated to read more than boys. The research showed girls read more books than boys (Elley, 1994) did. Wagemaker (Wagemaker and at all, 1996) and others, conclude that gender disparity can be better analyzed in the social context, meaning other factors such as family economic status and parents' education level should be taken into consideration. PISA 2009 international assessment results shed some light on the tendencies/discrepancies between male and female students in reading. Namely, girls are more actively engaged in reading activates during out of school time than boys do. Girls outperform boys in reading intensity every day. Experts in language arts argue that intensive reading raises probability of mastery not only in reading comprehension but also in other subjects. Based on the National Literacy Trust fund's report, discrepancy between boys and girls in out of school time reading is considerable. To be much more precise, 35% of girls and only 26% of boys said that they read every day. The same report showed that the disparity between percent of girls and boys involved in every day reading raised from 7% (in 2005) to 9% (2011). Another tendency detected is alarming for educators. Both girls and boys have lessened their engagement level in reading activities. This tendency was upheld by PISA 2009 international assessment data analyzes: the percentage of the pupils at the age of 15 that read every day for enjoyment has been reduced during 2000- 2009 in almost all member countries and economies of Organization for Economic Cooperation and Development (OECD)(Pisa at Glance, 2010). The correlation between gender and reading preferences were identified among primary school students in Greece. Data analyses indicated significant differences between male and female students in reading preferences, since the female students showed a greater preference for 'human-interest' stories and male preferred to read comics and action-stories. "The verbal data exposed the female students' flexibility in strategy use and their higher meta- cognitive awareness compared to male students. A particular focus of the discussion was on the possible factors, being in a dynamic interplay with the social context (family and school), which influence male and female students' reading preferences and define differences in reading strategies" (Alevriadou and others, 2011).Drastically opposite trends were shown by the research conducted in Uganda. At the national level in Uganda as a whole, reading performance for boys did not change much between 2000 and 2007. However, Reading scores for girls had dropped by about 10 points. At the regional level, the largest drop was in Eastern region with a 35 point drop for girls and a 24 point drop for boys. The largest increase was in Western region with a 49 point increase for boys, and a 22 point increase for girls. The largest gender difference in 2007 was seen in Northern region, followed by Eastern region with about 12 and 10 points, respectively, although the more serious problem was the general low achievement for both boys and girls (Byamugisha, 2011).

Coleman (1966) in his famous report presented a very powerful set of evidences that effect students learning. Among those evidences, family factor was emphasized as one of the key factors that should be taken into consideration by all stakeholders in the field of education. In order to test the validity of Coleman's report findings number of research studies were conducted in the United States of America and other countries. Among those research studies, two were more powerful. A number of insightful tendencies were discovered peculiar not only for the United States of America as the developed county but also developing counties. In order to see if there was a relationship between family backgrounds related variables and student academic achievement, Fuller (1987) analyzed data of developing countries. Multiple regression analyses were applied to examine that data. The study demonstrated that in developing countries family background factors did not have statistically significant impact on student academic performance. For instance, in India school related factors had about 90% effect on students' performance. Opposite findings were discovered by group of researchers (Baker, Goesling, and LeTendre 2002). Baker and others concluded that family background, parents' education level, number of books at home and student related factors were important contributors in student academic achievement. Data gathered from TIMSS 1995 international assessment in mathematics and science was analyzed. Another study conducted by Heyneman and Loxley (1983) showed that the impact of family socio-economic status varies

significantly depending on national economic development. Particularly, they found that family socio-economic status matters more than school-related factors for student learning outcomes in industrialized/developed countries, while school-related factors have considerable impact on student learning in less developed/developing counties.

1.3.5 Research Questions

Research intends to examine family, school, and student related factors influence on student academic performance in reading in developed (Estonia) and developing (Azerbaijan) countries. For this reason data from PISA 2009, international assessment, with the focus on reading was analyzed. The policy and decision makers of both countries could use tendencies identified by the research to design new policies and programs. Three research questions were developed. Research questions related to school factors was divided into three sub-questions. This was done for two reasons: to have more clarity and to deal with mass data.

The questions were developed for each participant country separately:

1) To what extent are student background variables associated with PISA 2009ninth-grade reading scores in each country?

2) To what extent are family-related variables associated with PISA 2009ninth-grade reading scores in each country?

3.1.) To what extent are school-related variables associated with PISA 2009ninth-grade reading scores in each country?

3.2) To what extent are instructional variables associated with PISA 2009ninth-grade reading scores in each country?

3.3.) To what extent are teacher-related variables associated with PISA 2009ninth-grade reading scores in each country?

2. Method

2.1 Data and Sample

The study used data gathered within PISA 2009 international assessment placing main emphasis on reading competencies. PISA assessments seek to capture the extent to which students can apply, in real-life situations, the knowledge and skills they have obtained at school. To this end, PISA employed a two-stage stratified sample design to first select the schools that had 15-year-old students and then students within the sampled schools. Thus, in March-May 2009, PISA surveyed around 470,000 15-year-old students in the schools of 64 OECD and partner countries. Each student completed a 2-hour paper-and-pencil task in reading, mathematics and science. The tasks were designed so that to allow multiple choice answers as well as require constructing individual answers. Additionally students were asked to complete a questionnaire about their personal background and learning habits. School principals and parents also completed a questionnaire to describe school and family environments.

2.2 Analytic sample

For the purpose of this study, students from Azerbaijan and Estonia were selected. In Azerbaijan 4,600 students from 162 public and private schools participated in the assessment and 99.4 %of the participants were 15 years old. Similarly, 4,923 students of 175 public and private schools were tested and 99.6% of them were 15 years old.

2.3 Weights

Because the PISA 2009 involved a multiple stage stratified sampling, the data include a series of weights. Therefore, the weights were applied to compensate for (1) unequal probability of selection and (2) non-response effects. In this study, analyses are weighted using student-level weights to allow the results to be generalized for the 15 year olds in both countries.

2.4 Dependent Variable

The following dependent variables were selected for the study:

a) Average scores in reading of Azerbaijani ninth grade students in PISA 2009 international assessment;

b) Average scores in reading of Estonian ninth grade students in PISA 2009 international assessment;

As for independent variables:

a) Student related variables (gender, attitude to reading, attitude towards school, attitude towards teachers, etc.)

b) Family related variables (Parents education, parents' involvement, etc.)

c) School related variables (class size, teacher related variables, academic tutoring, etc.)

2.5 Analytical Approach

In order to compare reading achievement of the 15 year olds in Azerbaijani and Estonia, the study employed an array of analytical techniques. Where the simple comparison of the two means was appropriate a student's t-test was applied. In other instances, analysis of variance was deemed relevant and this was applied.

Two countries from former Soviet bloc were selected to be compared: Azerbaijan as a developing country and Estonia as a developed country. Since, both qualitative and quantitative data were collected for the study a mixed research method was employed. 9the grade students average test scores in reading were considered as dependent variables. Data for independent variables were gathered from parents, school, and students questionnaires. The cleaned data, in SPSS format, for both independent and dependent variables were taken from Organization for Economic Co-operation and Development (OECD) webpage. The sampling error is less than 3% with a 95% confidence level (PISA at glance)

2.6 Statistical Method

Both descriptive (mean, mode, frequency, standard deviation) and inferential statistics (t test and General Linear Model – Univariate) were applied for data analyses.

3. Results

Countries participated in the study showed drastically different results. Namely, Azerbaijani 15 year- olds average test score in reading is 362. 95 (64 the place among 65 participant countries and economies). That is almost two standard deviation (SD – 73) less than Organization for Economic Cooperation and Development average – 493.

Descriptive statistics (Azerbaijan):			
		Reading scores	Z score
N	Participants	4600	4600
	Missing data	0	0
Average score		362.9472	.0000000
Median		361.7570	-.0162793
Mode		333.23[a]	-.40651[a]
Standard deviation		73.11394	1.00000000
Min score		131.36	-3.16746
Max score		634.98	3.72061
p		.005	

Estonian ninth graders average test score – 501 (13 the place among 64 participant countries and economies) is above the than Organization for Economic Cooperation and Development average – 493.

Descriptive statistics (Estonia)			
		Reading scores	Z score
N	Participants	4923	4923
	Missing data	0	0
Average score		501	.0000000
Median		502.7780	.0710174
Mode		522.06	.29640

Standard deviation	85.56305	1.00000000
Min score	159.34	-3.94282
Max score	753.06	2.99616

In this part of the article data is analyzed by inferential statistical methods and results are presented in comparative style.

Research question # 1:To what extent are student background variables associated with PISA 2009ninth-grade reading scores in each country?

Data analyses showed that Azerbaijani ninth graders have a noticeably negative attitude towards teachers; while their Estonian peers have a considerably positive attitude (except one when they asked whether or not teachers take good care of students) toward the teachers. An interesting tendency has been in Azerbaijani schools where the center of the learning process still is teacher driven, while students are the primary drivers of learning in Estonian schools. Estonian teachers push their students to express ideas. That promotes students active participation in the learning process. The majority of Estonian students answered positively to the following questions: "Most of my teachers really listen to what I have to say", "if I need extra help I will receive it from my teacher", "most of my teachers are interested in my well-being", and "most of my teachers treat me fairly". Data analyses on those questions showed that in case of Estonia there is a statistically significant positive relationship while opposite results were demonstrated in case of Azerbaijan. Furthermore, the same drastically opposite results were spotted when the questions regarding to students attitude towards school were analyzed. On the question: "school has done little to prepare me for adult life when I leave school "school has been a waste of time", "school has helped give me confidence to make decisions", and "school has taught me things which could be useful in a job". Estonian students' showed their trust to schools in preparing them for the future life. Research separately deals with usage of electronic resources in reading activities. Before stating results, it must be said that the reason of Estonia students' massive usage of electronic resources in reading activities could be very well organized national program "Tiger Leap".

Usage electronic resources for reading (Estonia)	**F**	**P**
Reading emails	5.207	.000
Online communication (Chat)	8.113	.000
Reading information online	2.570	.036
Reading online encyclopedia and dictionary	9.911	.000
Search inline information regarding to specific topic	11.766	.000
Participation in online discussions and forums	4.428	.001
Search online practical information (schedule, meetings, suggestions, etc.)	7.874	.000

Estonian student responses are statistically significant when it comes to usage of electronic resources in the reading activities. Drastically different results were found in Azerbaijan's case. Only two questions: 'Online communication" and "Participation in online discussions and forums "had statistically significant effect for Azerbaijani ninth graders. Both those questions are social media type. The Azerbaijani students needed to be assisted to use technology in more meaningful ways. That comes down to teacher qualification and mastery in information technologies. Some experts think, the teachers are not ready to do so yet.

Data concerning student attitudes toward reading assignments and reading at large was analyzed separately. In the case of Estonia, all variables except one "reading is my hobby" had statistically significant impact on student academic performance in reading. That indicates how popular reading is among 15year-olds. Again, opposite results were derived from Azerbaijani students data. Among 10 different variables, just three of them had statistically significant impact. Besides, two of those variables: "I read when I have to" and "I face difficulties to finish the book" can be deemed to have negative connotations.

Attitude towards reading (Estonia)

	F	P
Borrow books to read for pleasure	10.672	.000
I read only if I have to	12.640	.000
Reading is one of my favorite hobbies	1.378	.247
I like talking about books with other people	4.937	.002
I find it hard to finish books	4.383	.004
I feel happy if I receive a book as a present	2.699	.044
I enjoy going to a bookstore or a library	4.683	.003
I read only to get information that I need	11.991	.000
I like to express my opinions about books I have read	13.396	.000
I like to exchange books with my friends	7.489	.000

This study came up with the supportive notion that girls read more and are getting better scores in reading than boys. This tendency was statistically significant in both countries cases.

Research question # 2: To what extent are family-related variables associated with PISA 2009ninth-grade reading scores in each country?

Since information regarding household financial condition is not collected under PISA 2009 international assessment more emphasize was put to analyze data regarding parents' education. Data analyses demonstrated that in Azerbaijani case a parents' education did not have statistically significant impact on students' academic performance in reading:

List of independent variables	F statistics	Significant level
Mother's education	1.144	.334
Father's education	.424	.791
Mother's education * Mother's education	.890	.581

In the case of Estonia, only the mother's education had statistically significant impact on student academic performance in reading. A father's education, or both parent's education, have a statistically significant impact. At least two reasons could contribute to this: (1) Estonian government policy that supports mothers to stay at home longer, after giving birth of their children, without affecting their pay checks, than in any country in the world. As numerous research studies indicate, the more time mothers spend at home taking care of their children the better learner the child becomes; (2) based on European Union data on employment, dated October 2012, Estonia has one of the lowest unemployment rate (10,75%) of male workers (25 to 75 year-old) among the European Union countries (http://www.datosmacro.com/en/unemployment/estonia). That gives another boost to the families allowing mothers to afford staying at home to raise their children.

List of independent variables	**F statistics**	**Significant level**
Mother's education	3.526	.007
Father's education	1.626	.165
Mother's education * Mother's education	1.789	.057

Research question # 3.1.) To what extent are school-related variables associated with PISA 2009ninth-grade reading scores in each country?

Appealing tendencies were detected after the data analyses of school related variables.Even though average class size in Azerbaijani schools (18.44 students per class;) is smaller than in Estonian schools (23.14students per class), class size variable has statistically significant impact on student academic performance in reading in Estonia but not in Azerbaijan. There are several reasons that could contribute to this. As a number of researchers indicate (Hanushek, Heymenan, Darling-Hammond, etc.) there are a numerous other factors that have more influence on student academic performance such as classroom activities, resources, teacher qualification and determination, etc. than class size alone. Another contributing factor in the Estonian case is that most of students who lag back from the mainstream students population take additional courses, which help them to raise their scores. As this study showed, Azerbaijani students do not favor additional lessons offered by the school.

There was an interesting tendency discovered concerning school location in both counties: urban school students outperform their peers from rural areas in Azerbaijan, while there is a small advantage of city school to urban schools in Estonia, but this difference is not statistically significant. The difference between Azerbaijan and Estonia could be due to different urban development tendencies.

Different paths were detected concerning usage of library resources. Estonian school administrators state that school libraries are the busiest places in school not only afterschool time but during the class time as well. Libraries generally are used for group work, presentations, trainings in IT skills, internet search, etc., in parallel to the traditional purpose of a library as a place to check books out. That tendency was supported by the data analyses. There is a statistically significant impact on students' academic performance and independent variables related to library usage. In case of Azerbaijan, only selected group of students (high achievers) visit the library and the only purpose is to check out the books to read for pleasure.

3.2) To what extent are instructional variables associated with PISA 2009ninth-grade reading scores in each country?

Mostly student involvement in enrichment and remedial classes were analyzed under this research question. The following tendencies were noticed: in the Azerbaijani case, only enrichment classes have statistically significant impact on the students' academic achievements in reading, while both enrichment and remedial classes have statistically significant impact on the students' academic achievements in reading. As education experts argue, most high achievers are taking enrichment classes. If the school does not offer decent remedial classes students who lag back, suffer the most. Moreover, the gap between the high and low achievers is getting larger. That leads to the detrimental effect of segregation by their ability.

3.3) To what extent are teacher-related variables associated with PISA 2009ninth-grade reading scores in each country?

Among the independent teacher-related variables, teacher qualification had statistically significant impact on student academic performance in reading in both countries (Estonia - F - 30.497; p – .000; and Azerbaijan F = 18, 113; p - .000). Both countries used to be part of the former Soviet Union and most of their teachers graduated from the Soviet pedagogical institutes with knowledge in old teaching methods and techniques to promote communist ideology. However, both countries managed to train their teachers in modern teaching styles. In addition, Estonia managed to significantly increase teachers' salary, to raise teachers' social status and the popularity of the profession, and to set up modern academic programs for teacher preparation. Data analyses demonstrated that Estonian teachers effectively use modern teaching methods and approaches, support students to be actively engaged in the process, to think independently and critically. Those components, however, are not as well presented in Azerbaijani case.

4. Recommendations

Based on the data analyses, obtained from the PISA 2009 international assessment of the two participant countries: Estonia and Azerbaijan, a separate set of recommendations are proposed:

4.1 Azerbaijan

- To launch programs to raise parents involvement in students life;
- To elaborate a strategy that ensures increase efficiency of remedial lessons;
- To introduce a new academic program for teacher preparation;
- To involve more teachers in intensive training courses regarding modern teaching methods and approaches;

- To raise school society awareness that students are at the center of educational process;
- To pay more attention to language arts taking into consideration all five segments of the reading assignment in PISA 2009 test. Since the class size is very small (on average 18.44 students per class) teachers will have plenty of time to schedule class time properly;
- To equip libraries with updated literature and necessary equipment;
- To promote different meaningful activities (group work, presentation, seminars, peer tutoring, trainings in IT usage, etc.) to be done in library;
- To elaborate programs that will ensure the rise of popularity of reading activities;
- To engage more boys into different meaningful reading assignments;
- To use more electronic resources and IT in reading assignments;
- To raise teachers social status;
- To increase students and their parents trust towards schools.

4.2 Estonia

- To develop programs that would ensure boys active involvement in different reading activities;
- To develop programs for both girls and boys that would help them perceive reading as their hobby. As PISA 2009 data analyses show, students are better learners when they read for pleasure;
- To ensure high quality enrichment lessons in subjects other than reading, math and science;
- To provide higher quality remedial lessons in science;
- To raise teachers awareness that students wellbeing is a paramount goal of educational institutions;
- To develop sustainable development plans that have positive impact on students' academic performance;
- To conduct research that detail what the needed skills and knowledge in the coming decade students should master to be successful in the workforce.

Outcomes of this study support findings of research studies quoted in the literature review section. Namely, school, family, and student factors influence on students' academic achievements in regarding. Findings derived from this research could prove useful by other countries policy and decision makers as well. This would be especially true in the case of former Soviet bloc countries. Those countries are still dealing with impact of Soviet style education. In addition, the developing counties educators could consider research outcomes. As well, this research might prove useful for other developing countries.

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